WHAT IS CLAIMED IS:

1. A MEMS variable optical attenuator (VOA) comprising:

a. at least one semitransparent refraction-mode shutter operative to attenuate an optical beam transmitted along an optical path from a first optical fiber to a second optical fiber, using refraction of said beam; and

b. an actuator operative to position said at least one shutter in said optical path along a movement axis.

2. The MEMS VOA of claim 1, wherein each fiber ends in an angled facet, wherein said position includes a position in which said movement axis is parallel to said facets, wherein said at least one shutter includes a first sidewall and a second sidewall, said second sidewall having a plurality of sections forming each a different angle with said first sidewall, and wherein said refraction is determined by each said angle.

3. The MEMS VOA of claim 1, wherein said at least one shutter includes two shutters.

4. The MEMS VOA of claim 1, wherein said actuator includes at least one comb drive.

5. The MEMS VOA of claim 1, wherein said actuator includes a frame with a plurality of springs, at least one of said springs connected to said at least one shutter.

6. The MEMS VOA of claim 5, wherein said at least one spring is straight.

7. The VOA of claim 5, wherein said at least one spring is selected from the group consisting of a curved spring and a bent spring.

8. The MEMS VOA of claim 5, wherein said actuator further includes at least one comb drive.

9. The MEMS VOA of claim 5, wherein said shutter is serpentine-shaped.

10. The MEMS VOA of claim 6, wherein said actuator further includes at least one side electrode interacting electrostatically with said frame.

11. The MEMS VOA of claim 7, wherein said actuator further includes at least one side electrode interacting electrostatically with said frame.

12. The MEMS VOA of claim 6, wherein said actuator further includes at least one offset comb drive.

13. The MEMS VOA of claim 7, wherein said actuator further includes at least one offset comb drive.

14. The MEMS VOA of claim 13, wherein said at least one offset comb drive is symmetrical.

15. The MEMS VOA of claim 1, further comprising at least one damper selected from the group consisting of a squeeze film damper, an impact damper, and a combination thereof, said at least one damper connected to said at least one shutter and used for shortening a VOA switching time.

16. The MEMS VOA of claim 1, further comprising at least one locking mechanism used to hold said at least one shutter in a locked position after actuation.

17. The MEMS VOA of claim 7, wherein said actuator is a high resolution radial-to-linear (RTL) actuator operative to translate a radial movement of said curved spring into a much smaller linear movement along said movement axis.

18. The MEMS VOA of claim 1, wherein said shutter is vertical.

19. The MEMS VOA of claim 17, further comprising a side electrode interacting electrostatically with said curved spring to provide said operability.

20. A variable optical attenuator comprising:

a. a transparent silicon shutter having two, a first and a second, non-parallel shutter sidewalls, each said sidewall having an arbitrary shape, said shutter operative to attenuate an optical beam transmitted along an optical path from a transmitting fiber having a transmitting optical axis and facing said first shutter sidewall to a receiving fiber having a receiving optical axis and facing said second shutter sidewall, wherein said attenuation is based on a tilt induced by a variable angle between said two non-parallel shutter sidewalls, said variable angle dependent on a position of said shutter relative to said beam; and

b. an actuating mechanism for positioning said shutter in said optical path.

21. The variable optical attenuator of claim 20, wherein said shape is a wedge shape with a narrow top and a wider bottom, said wedge shape formed by a plurality of trapezium cross-sections with first and second trapezium sidewalls, said first trapezium sidewalls forming said first shutter sidewall and said second trapezium sidewalls forming said second shutter sidewall.

22. The variable optical attenuator of claim 21, wherein each said transmitting and receiving fiber ends in a fiber facet angled relative to its respective optical axis, and wherein said actuator mechanism includes an electrostatically driven actuator that displaces mechanically said shutter in a direction substantially parallel to said fiber facets.

23. The variable optical attenuator of claim 22, wherein said first shutter sidewall is positioned at a first angle relative to said transmitting fiber facet, and wherein said

second shutter sidewall is positioned at a second angle different from said first angle relative to said receiving fiber facet.

24. The variable optical attenuator of claim 20, wherein said attenuation includes beam refraction at each said sidewall.

25. The variable optical attenuator of claim 20, implemented in a silicon-on-insulator (SOI) substrate having an active layer and a handle layer, wherein said silicon shutter and said actuating mechanism are built in said active layer, and wherein said fibers are positioned in V-grooves etched in said handle layer.

26. A MEMS variable optical attenuator (VOA) characterized by a switching time comprising:

a. at least one semitransparent refraction-mode shutter having a wedge shape and operative to attenuate an optical beam transmitted along an optical path from a first optical fiber to a second optical fiber, using refraction of said beam;

b. an actuator operative to position said at least one semitransparent refraction-mode shutter to intersect said optical path; and

c. at least one damper selected from the group consisting of a squeeze film damper, an impact damper, and a combination thereof, said at least one damper connected to said at least one shutter and used for shortening the VOA switching time.

27. A MEMS variable optical attenuator (VOA) comprising:

a. at least one semitransparent refraction-mode shutter having a wedge shape and operative to attenuate an optical beam transmitted along an optical path from a first optical fiber to a second optical fiber using refraction of said beam;

b. an actuator operative to position said at least one semitransparent refraction-mode shutter to intersect said optical path; and

c. a locking mechanism for locking said shutter in an actuated position.

28. An integrated variable optical attenuator and 2X2 optical switch component comprising:

a. four tapered and angled optical fibers arranged as two transmitting and two receiving fibers in a butt-coupling setup; and

b. a MEMS element operative to perform both switching and variable optical attenuation of an optical beam transmitted along an optical axis between one of said transmitting fibers to one of said receiving fibers.

29. The integrated component of claim 28, wherein said MEMS element includes a blocking type triangular shutter having an opening therein, said opening allowing said optical beam un-attenuated transmission when properly aligned with said optical axis.

30. A MEMS variable optical attenuator (VOA) comprising:

a. a shutter operative to attenuate an optical beam transmitted along an optical path from a first optical fiber to a second optical fiber;

b. an actuator operative to position said at least one shutter to intersect said optical path, said actuator including a folded suspension having a plurality of springs, at least one of said springs connected to said at least one shutter, wherein said springs are selected from the group consisting of curved springs and bent springs.

31. The MEMS VOA of claim 30, wherein said actuator further includes at least one comb drive.

32. The MEMS VOA of claim 30, wherein said shutter is serpentine-shaped.

33. A MEMS variable optical attenuator (VOA) comprising:

a. a shutter operative to attenuate an optical beam transmitted along an optical path from a first optical fiber to a second optical fiber;

b. an actuator operative to position said at least one shutter to intersect said optical path, wherein said actuator includes:

i. a folded suspension having a plurality of springs, at least one of said springs connected to said at least one shutter; and

ii. at least one side electrode interacting electrostatically with said frame.

34. The MEMS VOA of claim 33, wherein said actuator further includes at least one offset comb drive.

35. The MEMS VOA of claim 34, wherein said at least one offset comb drive is symmetrical.

36. The MEMS VOA of claim 33, further comprising at least one damper selected from the group consisting of a squeeze film damper, an impact damper, and a combination thereof, said at least one damper connected to said at least one shutter and used for shortening a VOA switching time.

37. The MEMS VOA of claim 33, further comprising at least one locking mechanism used to hold said at least one shutter in a locked position after actuation.

38. The MEMS VOA of claim 33, wherein said shutter is vertical.

39. A MEMS variable optical attenuator (VOA) comprising:

a. a shutter operative to attenuate an optical beam transmitted along an optical path from a first optical fiber to a second optical fiber; and

b. a high resolution radial-to-linear (RTL) actuator having at least one pre-curved spring connected to said shutter, said actuator operative to translate a radial movement of said pre-curved spring into a much smaller movement that positions said shutter to intersect said optical path.

40. The MEMS VOA of claim 39, further comprising a side electrode interacting electrostatically with said curved spring to provide said operability.